REMARKS

Claims 1-19 remain pending in this application. Claims 9-19 have been withdrawn from consideration as being directed towards a non-elected invention. Each of the examined claims is believed to define an invention which is novel and unobvious over the cited references. Favorable reconsideration of this case is respectfully requested.

Submitted herewith on separate sheets are replacement sheets for the drawings as required by the Examiner. The correspondence between the original drawings and the replacement drawings and support in the specification for the replacement drawings is provided in the following chart:

present Figures	proposed figures
fig. 1(A) – 1(C)	fig. 1(A) – 1(C)
fig. 2 (A) – 2(C)	fig. 2(A) – 2(C) (corrected)
	fig. 3(A) – 3(C) (new, corresponding to devise structure of first embodiment)
fig. 3	fig. 4
fig. 4(A) –4(B)	fig. 5(A) – 5(B) (corrected
	fig. 6(A) – 6(B) (corrected (B) and (C))
	fig. 7(A) – 7(B) (new, corresponding to devise structure of second embodiment)
fig. 6(A) – 6(D)	fig. 8(A) – 8(D)
fig. 7(A) – 7(C)	fig. 9(A) – 9(C) (corrected)
	fig. 10(A) – 10(B) (new, correspond to devise structure of 3rd embodiment)
fig. 8(A) – 8(D)	fig. 11(A) – 11(D)
fig. 9(A) – 9(D)	fig. 12(A) – 12(C) (corrected (B) and (C))
	fig. 13(A) - 13(B) (new, corresponding to devise structure of 4th embodiment)
fig. 12(A) – 12(C)	fig. 17(A) – 17(C)
fig. 13(A) – 13(D)	fig. 18(A) – 18(D) (corrected)
	fig. 19(A) – 19(B) (new, corresponding to devise structure of 6th embodiment)
fig. 14	fig. 20

fig. 15(A) – 15(B)	fig. 21(A) –21(B) (corrected)
	fig. 22(A) – 22(B) (new, corresponding to devise structure of 7th embodiment)
fig. 16(A) – 16(D)	fig. 23(A) – 23(D)
fig. 17(A) – 17(E)	fig. 24(A) – 24(E)
fig. 18	fig. 25
fig. 19	fig. 26
fig. 30	fig. 27 (corrected)

Also submitted herewith is a Substitute Specification. The specification has been amended to reflect the new drawing numbers. No new matter has been added to the application.

Claims 1-8 have been rejected under 35 U.S.C. 112, second paragraph as being indefinite. Independent claims 1, 3 and 4 have been amended and are believed to be in compliance with 35 U.S.C. 112, second paragraph. Therefore, the withdrawal of this rejection is respectfully requested.

Claims 1-8 have been rejected under 35 U.S.C. 103(a) as being anticipated by U.S. Patent Number 5,612,254 to Mu et al. Mu et al. do not anticipate the present invention as it does not disclose, among other things, a plurality of nitride films formed on the base oxide film where the nitride films are separate from neighbouring nitride films as recited in amended claims 1 and 3 or the barrier and wiring metal having a first portion on the base oxide film and a second portion at a middle section of upper oxide film, the first portion having a smaller width than the second portion as recited in amended claim 4.

Mu et al. discloses that a silicon nitride film 23 is provided on a BPSG layer 22. An oxide film 50 is provided on the silicon nitride layer 23, column 6, lines 34-49. A titanium nitride barrier layer 60 and a metal layer 61 are embedded in a groove provided in the oxide film 50, column 6, lines 50-63. As shown in Figures 1-11 and described at column 5, line 67 – column 6, line 7, the silicon nitride film 23 is provided on the entire face of the BPGS layer 22 for the wiring groove. There is no disclosure in Mu et al. of providing a plurality of nitride films separately for the plurality of wiring grooves.

In comparison, with reference to replacement Figures 3A, 3B, 19A, and 19B, amended claims 1 and 3 both recite that a plurality of nitride film patterns 16 are formed on the base oxide film 12. A plurality of wiring grooves 28 are formed to expose part of the nitride film patterns 16. The nitride film patterns 16 are formed such that they are separate from each other. For example, in Figures 3A, 3B, 19A, and 19B, three separate nitride film patters 16 are shown around different groups of holes 30. Each of the nitride film patterns is directly connected to respective holes 30 and separate from other nitride film patterns 16. Please see page 8, line 27 – page 9, line 16 and page 4, line 8 – page 5, line 7 of the present specification for a description of this feature. Accordingly, it is clear the Mu et al. does not teach or suggest separate nitride film patterns as recited in amended claims 1 and 3.

Claim 4 has been amended to recite that barrier and wiring metal 35, 36 fills each of holes 30 and each of wiring grooves 28. The barrier and wiring metal 35, 36 has first portions 37A on the base oxide film 12 and second portions 37B at the middle section of

the upper oxide film 26 above the first portions 37A. Each of the first portions 37A has a width W1 that is smaller than a width W3 of each of the second portions 37B, as shown in replacement Figure 22.

In comparison, Mu et al. discloses that the titanium nitride barrier layer 60 and the metal layer 61 embedded in the plurality of grooves are merely embedded so as to have the same, uniform width within oxide film 50. There is no teaching or suggestion in Mu et al. that the wiring metal embedded within the grooves of the upper oxide film has a first portion having a first width that is broaden so as to expose the periphery of the first holes in the base oxide film and a second portion of wiring metal having a second width formed above the first portion and that is smaller than the first width as is recited in amended claim 4.

By providing a device having the structure recited in independent claims 1, 3 and 4, several advantages can be obtained. By providing a plurality of nitride films that are separate from each other for the plurality of wiring grooves, the sides of the respective patterns of the nitride films can be made smaller. It is therefore possible to provide a highly reliable semiconductor device capable of reducing problems associated with the stress of the nitride film. Particularly, since a part of each of nitride film remains sandwich between the base oxide film and the upper layer oxide film, it is possible to reduce problems such as the nitride film peeling off from the base oxide film due to the stress of the nitride film. Additionally, by providing device having a width W3 at the middle section of the wiring groove 28 to be smaller than the width W1 at the bottom

section thereof, the width of the first portion 37A is substantially wider than the width of the second portion 37B. Accordingly, the embedded state of the embedded wiring metal can be maintained even more firmly.

In view of the above discussion, it is clear that there is no teaching or suggestion in Mu et al. of the combination of features recited in the amended claims. Therefore, the withdrawal of this rejection is respectfully requested.

Claims 1-8 have been rejected under 35 U.S.C. 103(a) as being anticipated by European Patent Application No. 0892428A2 to Nguyen et al.

Nguyen et al. discloses that a first trench 172 is formed in a first dielectric interlevel 166. A step portion is provided in dielectric 166 with a second barrier layer 178 formed in the surface of the step portion, a second metal level 188 is embedded in the first trench as illustrated in Figures 14-18. The first trench 172 is formed entirely in one dielectric interlevel 166, column 10, lines 36-57. Nguyen et al. does not include a base oxide film or an upper oxide film as is recited in claims 1, 3 and 4 of the present invention.

Contrastingly, each of claims 1 and 3 recite that the upper oxide film is provided on top of the base oxide film to cover the nitride film pattern. Nguyen et al. merely describes that the second barrier layer 178 is provided on the step portion. There is no teaching or suggestion that the nitride film is covered by the upper oxide film. In fact, what the Examiner contends is upper oxide film 170 does not cover second barrier layer 178 as shown in Figures 14-18 of Nguyen.

Furthermore, amended claim 4 recites that the wiring metal has first and second portions with the second portion having a diameter at a middle section of the upper oxide film that is smaller than the diameter of the wiring metal in the first portion. There is no teaching or suggestion in Nguyen et al. of this feature.

Although Figures 14-18 of Nguyen et al. disclose a wiring groove with a step, the diameter of the first thickness 168 is smaller than the diameter of a second thickness 170. Thus, Nguyen et al. discloses a structure that is opposite to the structure in which the wiring metal embedded in the grooves of the upper oxide film has a first portion having a first width that this broaden so as to expose the periphery of the first holes in the base oxide film and the second portion of the wiring metal having a second width that is smaller than the first width of the first portion as is recited in amended claim 4.

In addition, Figure 9 of Nguyen et al. discloses that the second metal level 48 provided within the hole and on the upper surface of a first dielectric interval 36 and a second dielectric interlevel 52 having a hole for exposing a part of a second metal level selected areas 60 of a second metal level 48, are provided to the first dielectric interlevel 36. However, the second metal level 48 is not embedded in the hole provided within the second dielectric interlevel 52. Thus, this structure is entirely different from the structure of employing a wiring metal embedded in the holes of the base oxide film and the wiring grooves of the upper oxide film, respectively, as recited in amended claims 1, 3 and 4. Furthermore, the manufacturing process disclosed in Figure 9 of Nguyen et al. is not capable of embedding the second metal level 48 in the hole provided within the second

dielectric level 52. Therefore, Nguyen et al. does not contain any teaching or suggestion of a wiring metal embedded in the holes of the base oxide film in the wiring grooves of the upper oxide film as now claimed.

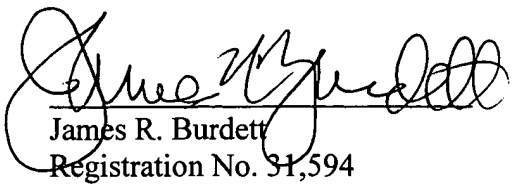
In view of the above discussion, the withdrawal of the rejection of claims 1-8 over Nguyen et al. is respectfully requested.

If the Examiner is of the opinion that the prosecution of this application would be advanced by a personal interview, the Examiner is invited to telephone undersigned counsel to arrange for such an interview.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made.**"

The Commissioner is authorized to charge any fee necessitated by this Amendment to our Deposit Account No. 22-0261.

Respectfully submitted,



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DC2/462217

VERSION SHOWING CHANGES MADE

IN THE CLAIMS:

Please amend the claims as follows:

1. (Twice Amended) A semiconductor device, comprising:

an underlayer;

a base oxide film with first holes and formed on the underlayer;

a plurality of nitride film patterns, each having ~~with~~ a hole pattern, respectively, formed on the base oxide film and directly connected to ~~above~~ said first holes, respectively;

an upper oxide film provided on top of said base oxide film to cover the nitride film patterns, the upper oxide film having formed therethrough ~~an~~ plurality of wiring grooves which each ~~exposes~~ reaches part of an associated nitride film pattern including said hole patterns; and

wiring metal that fills ~~part of the exposed nitride film patterns,~~ said first holes, and said wiring grooves;

and wherein said nitride film patterns are ~~formed with such~~ separate from each other and a shape and size that ~~surrounds~~ extends from the outside of their associated wiring groove ~~and are separate from neighbouring nitride film patterns~~.

3. (Twice Amended) A semiconductor device, comprising:

an underlayer;

a base oxide film with first holes formed on the underlayer;

a plurality of nitride film patterns ~~with a~~ on the base oxide film, the nitride film patterns having formed therethrough hole patterns, respectively, which are ~~provided on the base oxide film and~~ formed directly ~~above~~ connected to and wider than said first holes respectively;

an upper oxide film provided on top of said base oxide film to cover the nitride film patterns, the upper oxide film having formed therethrough a plurality of wiring grooves which each exposes part of ~~an associated~~ the nitride film patterns including said hole patterns; and

wiring metal that fills part of each of the exposed nitride film patterns, each of said first said holes, each of said hole patterns, and each of said wiring grooves;

and wherein an outer shape of each of said nitride film patterns is substantially the same as the shape of the opening of each of said wiring grooves, an internal wall surface of each of said wiring grooves is tapered from the opening on ~~the~~ an upper surface of said upper oxide film to upper surface of each of said nitride film patterns, and neighbouring nitride film patterns are separate from each other.

4. (Twice Amended) A semiconductor device, comprising:

an underlayer;

a base oxide film formed on the underlayer, the base oxide film having formed therethrough a plurality of first holes;

an upper oxide film provided on the base oxide film, the upper oxide film having formed therethrough wiring grooves which are connected to said first holes, respectively; and

barrier and wiring metal that fills each of said first holes and each of said wiring grooves, said barrier and wiring metal having a first portions on the base oxide film and second portions at a middle section of said upper oxide film above said first portions, and each of said first portions having a width W1 smaller than a width W3 of each of the second portions ~~around the periphery of said hole having a first diameter and a second portion at a middle section of said upper oxide film above said first portion having a diameter smaller than the first diameter~~.